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SECTION 6 - COST COMPARISONS AND FINANCING CONSIDERATIONS

I. BALANCING COSTS AND POTENTIAL PRIVATE SECTOR REVENUES

Cost will ultimately determine the future of this project. It is assumed that at some point in the future, all other project factors will reach a balance with cost and the project will go forward. It is an underlying belief of this document that HST implementation can proceed faster if the project's priorities are given a genuine review with special emphasis on greatly expanding the private sector participation and, in return, allowing it to share risks and rewards.

II. HISTORY OF FUNDING MAJOR TRANSIT INFRASTRUCTURE PROJECTS

A. This concept of transit projects joint development may have found its sources in the US and, like so many other innovations, adopted and improved by other societies such as the Asian examples in the post WWII era.

B. The contemporary participation of the private sector in transportation projects is via joint development in properties at and adjacent to stations. This formula has been successful in funding HSR projects such as the Shinkansen in Japan and similar systems in Taiwan, Korea, and Hong Kong. (*See Appendix for general descriptions and links to these projects*).

III. REQUIRED RESEARCH

A. EXPLORING CREATIVE BUSINESS STRATEGIES

1. Joint development, which typically occurs around and over stations, provides cost sharing at those locations. A review of High-Speed systems cost estimate or budgeting will show that the greater costs are the "civil works", i.e., the hundreds of miles of rights-of way, earth work, track work, power and communications systems and, greater yet, the trains.

2. This proposal suggests that, in addition to the joint development with private sector funding participation around stations, new strategies should be explored to extend the joint development funding opportunities to non-station sections, along the alignment.

B. POTENTIAL JOINT DEVELOPMENT OPPORTUNITIES ALONG RIGHTS-OF-WAY

1. Telecommunications: the need for direct routes cabling in telecommunications has been a source of revenue to transit systems. Experts can determine if this is still a potential source of revenue for HST;

2. Piped utilities along rights-of-way, including these proposed Bay Bridge HSR routes, may be additional revenue opportunities;

3. Electrical power is needed along the alignment for powering the trains. A basis of the CAHSRA business plan is a substantial continued population growth in the future requiring improved transportation options. Such growth will also need new electrical generation and distribution systems. If the HST will serve these expanding population

I131-1 cont.

centers, the opportunity may exist to co-locate power distribution rights-of way with the HST. Efficiencies of environmental approval may also be possible and the visual impact of towers may be mitigated by some consolidation of routes;

4. More specific to the Bay Area, possible expanded joint developments include:
   a. Oakland Army Base - As noted in the introduction, this proposal includes a bridge and viaduct route through the Oakland Army Base. The adjacent freight railroads are also working under some access limitations to the Port of Oakland. Although the issues are complex, there may be ways in which the all parties, i.e., the Base, freight railroads, the City of Oakland, other adjacent property owners, and the CAHSRA, might coordinate adjustments to uses of the available land to the benefit of all parties involved. This concept presents great potential and is worth pursuing.

   b. BART-Oakland - As noted in the project description, a new BART station is proposed at the Oakland HST Station. This new station offers some smaller scale joint development opportunities, both at the Station and in the surrounding area.

   c. BART-SF - In addition, the new BART Station (at or near Market Street) offers the opportunity to take some rush hour Trans Bay Tube passenger load off of BART if a direct and convenient transfer to HST is provided. A complex issue, the details of which are beyond the scope of this document, but let us assume that it can be done. This would increase BART capacity by adding another rail option. A net impact may be fewer buses arriving at the TBT.

   d. AC Transit buses - Consequently, the total number of AC Transit express buses crossing the Bay Bridge could be reduced. However, many of these buses will be picking up passengers in the East Bay. They could possibly terminate in Oakland, and AC Transit, needing a place to park its buses, may be a candidate for leasing or acquiring some available industrial property in the area.

   e. Driving commuters - Driving commuters may also choose to park in the area and take BART or the HST in Oakland and would thus create the need for parking structure that then could support a mixed-use residential, retail, commercial development, eventually stimulating growth for everything from daycare to health care and senior citizens facilities.

   f. Finally, as a potential joint development opportunity, CAHSRA, should consider the potential tourist revenue that could be generated with marketing to the travel and hospitality community. Hotels located at stations are an obvious opportunity. The new cruise terminal proposed under the Bay Bridge, at Spear Street, appears to offer a new, albeit small but steady, source of revenue. HST passengers should be able to choose to ride only Oakland on a round trip, walk on the pedestrian path, or make a joint booking with HST to travel to Southern California by train one way and by cruise ship on return. European airlines and railways have proven the potential of this joint booking.

I131-1 cont.

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SECTION 7 - VISUAL CONSIDERATIONS

I. San Francisco Grand Central

The scope of this document does not comment upon issues of architectural design for the Transbay Terminal or the proposed HST Station. The understanding of the numerous factors examined in detail by the consulting teams for The Transbay Redevelopment Project and the Rincon Hill Plan, and other related studies and designs could not possibly be assimilated during the preparation of this proposal.

The merit of the recommendations of those designs and studies is accepted and considered as design criteria, guidelines, or standards, for any further development of the ideas described in this document.

The sketches in this document that have architectural implications are offered as a means to communicate the idea of San Francisco Grand Central. They are a preliminary attempt to place the proposed building, SFGC and the proposed elevated HST Station in the existing context for examination by the public.

The development of this document has provided some insight into the features of both the Rincon Hill Plan and the Transbay Redevelopment plan.

An understanding of the importance of daylight throughout the Transbay Terminal is acknowledged by a suggestion that the HST Station also be as open and clear as possible. It is further suggested that, if technically feasible, appropriately safe glazed openings in the slab below the trains be investigated to allow passengers on the concourse to notice the shadow of the high-speed trains arriving and departing.

I131-1 cont.

In response to the Rincon Hill Plan, it is understood that a building of the magnitude of the HST Station be carefully studied to reduce its real and perceived mass and that the continuity of recognized pedestrian elements such as Folsom Avenue be allowed to penetrate the building to the maximum possible degree. This recommendation takes precedence over other sections of this document that discuss the significant potential joint development opportunities of the SFGC and the elevated HST Station.

It is hoped that these ideas will be catalysts for preliminary investigation of integrating the HST into the Transbay Terminal and Rincon Hill urban design.

A final suggestion that is offered both as a consideration for any design study of the SFGC: it is not necessary to design a highly detailed structure to initiate HST service. As visitors to Japan may have noticed, the high-speed rail stations in Tokyo and other cities are often very utilitarian. Finishes are serviceable first and spaces are functional, if not grand. This is not to suggest that standards should be lowered. It is a suggestion that the desired level of detailing and finish could be evaluated for phased implementation in order to expedite the inauguration of HST service. There may even be programmatic options such as using the lower levels of the super-structure of the HST building for temporary storage of buses while the Transbay Terminal project is under construction.

II. The Bay Bridge

The Golden Gate Bridge is probably the most recognized icon of SF and the Bay Area; however, the Bay Bridge is more impressive in many ways.

It is longer and as result of using similar technology of the graceful curving main suspension cable of that era, it has to repeat itself creating a rhythm of two bridges with five spans, hence carrying the rhythmic motion into the city. On the San Francisco side, riders and commuters often see the Bay Bridge on the oblique and from below: they are thus offered the excitement of the soaring arc over the Bay.

The arrangement of the first bridge tower on the west side of the Embarcadero, at the end of Spear Street, allows a substantial overlap of bridge and land. The image of the Bridge from the south along the Embarcadero is that the suspension cables are anchored right into the base of Rincon Hill, which in fact, it is.

It is this strong, stable, yet dynamic, spirit of the Bay Bridge, with its harmony of proportions, which should be protected by and if possible, reinforced by any proposed changes.

A goal of this proposal is to illustrate how an addition of railway structure to the Bridge can be configured to maintain the strong horizontal clarity of the structure.

The tubular lattice structure of the railway enclosure is scaled to fall entirely within the vertical distance between the upper and lower decks. This is important because the concept maintains several existing conditions about the visual experience of the automobile passenger riding: from the upper deck nothing should encroach on the view of the vehicle passenger at 5 feet above roadway level in the outer lanes. The experience of the first time visitor to the city should always be as spectacular as it is today and has been since the bridge was built.

I131-1 cont.

To accomplish this, the structure must be supported primarily from the lower deck. See the bridge section and Sketch Nº The tubular lattice will inevitably further obstruct the view of eastbound traffic. However, this can be mitigated if the system is designed to keep the heaviest structure at the bottom approximately at the level of the lower deck roadway.

The scale, proportions, and structural modules of the lattice should match the existing bridge truss panels allowing appropriate attachment points between the two systems. A structural design goal will be the attainment of the lightest possible structure. Creative structural designers should be able to achieve an adequately rigid and flexibly compatible system that is in visual harmony with the Bridge.

The resulting composition should do no harm to the image we have of the Bridge and in fact should be an enhancement of the whole.

There is no way to add the structure for the HSR to the Bridge without permanently altering the appearance of the Bridge. Materials, construction details, and finishes must be chosen carefully to provide a structurally appropriate, pleasing composition.

The aim is to enhance the appearance and image of the Bridge. This will not be easy for many purists.

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High strength steels and advanced concrete formulations, etc. not only offer creative structural solutions; they offer low or no maintenance finishes. Additional elements on the Bridge should be an asset, not a liability, adding sparkling wonder..

The fortuitous location of Yerba Buena Island provides an appropriate background and separation from the original East Span.

Now that there is a new strong bi-directional element on the Bridge, the image of YBI as a backdrop is no longer entirely correct. This proposal requires that the railway lattice tubes penetrate YBI on either side of the existing two-level tunnel. These tubes may need to begin to slope up on the west side of YBI in order to exit the east side of the island above the bi-level approach from the new East Span.

I131-1 cont.

SECTION 8 - ENGINEERING ISSUES

All of the following opinions have been developed after very limited reviews of available relevant reports. The opinions are presented with qualifying or clarifying factors, including references to the original sources. It is hoped that interested individuals and organizations will explore and validate or invalidate these assumptions.

I. CONSTRUCTION OVER STREETS

A. Buildings that span city streets are structural challenges but so is tunneling under existing streets and buildings.

B. The proposed design of San Francisco Grand Central HST Station also spans streets and viaducts, and brings in the complexity of the heavy roof loads of arriving and departing trains.

C. Examples of elevated train stations in seismic zones are not common in the United States, but many stations have been built in Japan, above buildings and streets, and continueto function successfully resist earthquakes.

II. ATTACHING THE HSR TO THE BAY BRIDGE

A. It should be understood that the Bay Bridge was originally designed to carry commuter rail service and did so until 1959 on the two outer lanes of the lower deck. This arrangement would of course be the preferred configuration of renewed rail service on the Bay Bridge. However, extreme dependence on personal automobile access to the city will render this approach unrealistically far into the future.

B. See Bay Bridge Rail Feasibility Study, prepared in July 2000 for the Metropolitan Transportation Commission. This report explored four different options to add rail service on the Bay Bridge. At the time the report was prepared decisions about the status of the East Span were pending. It can be assumed that the East span will be demolished. However, this proposal includes a recommendation that the existing piers be evaluated for re-use for a new HSR bridge.

I131-1 cont.

C. The Bay Bridge Rail Feasibility Study included evaluations of three types of rail service: Light Rail service, such as MUNI streetcars, current BART commuter rail, and conventional passenger rail such as Caltrain or Amtrak, including high-speed versions of these systems. This commentary will only consider an advanced, light weight high speed train. The Study also examined the routes or service areas that these options might serve on the east side of the Bay Bridge. This document does not consider further these explorations. The discussion of the high-speed train service on the East Side of the BB is limited to a review of possible routes, or alignments from YBI to downtown Oakland. See Section 6 – Description of Bay Area Segments.

D. The weight of any train system is of critical importance in a discussion on installing tracks on the Bay Bridge.

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E. The Study examined three possible options: an upper deck addition on each side of the outside of the suspension system; a similar addition at the lower deck level and a third option underneath the lower deck.

F. None of these options are considered feasible by this commentary. Options 1 and 2 are shown as large roadway platforms that are braced and attached to the existing bridge as extensions of the roadways or the upper or lower desks. The third option, the tracks suspended below the lower deck is conceptually and structurally the most realistic of the three. Nevertheless, it is impractical for two significant reasons: Approximately 30 feet of shipping clearance below the bridge would lose and it requires major structural modifications to cut the tracks through the center of the top of the tower supports. It also changes the appearance of the bridge from the middle and distant views, making the suspended structure much deeper. Part of the harmony of the countless views of the bridge as an element in the image of the city is the subtle balance between the structural necessity and the visually logical balance of a suspension system and a suspended structure. This last option would alter the visually correct image as we know it.

III. Building Rails Overhead vs. In Tunnels

A. Bay Area residents are familiar with the proven integrity of the overhead railways of BART. These viaduct structures are approaching 30 years of age and have received very limited structural improvements while allowing virtually uninterrupted reliability. (This is not to say that they are state of the art. Structural engineering design for seismic forces is a continuously evolving science. In addition, the November 2006 ballot will ask Bay Area residents to approve bonds to fund long overdue seismic improvements.)

B. Advances in materials sciences and structural design can offer appropriate overhead viaduct designs for the proposed HSR alignment in this commentary. These new viaduct structures must be a *combination, synthesis state of art, structural work of art, structurally efficient and visually pleasing* element in the landscape, whether urban or rural.

C.

D. The cost of tunneliing anywhere is high and in a seismic zone, under a major metropolitan area is very high, even for short distances. Tunneling methods vary but the complexity of the task, extreme coordination requirements, identifying known underground structures such as foundations and , dealing with unknown underground structures when they are encountered, utilities, property rights, pedestrian and vehicular traffic disruption all contribute to extremely high costs.

E. The geometric requirements of railways impose even greater limitations. The radius of turns for trains is quite large and when an acceptable layout is coordinated with the specific restrictions of the site costs can become literally prohibitive.

I131-1 cont.

SECTION 9 - PEDESTRIAN AND BICYCLE COMMUTING

I. Bike/Pedestrian Opportunities

The new East Span of the Bay Bridge will finally provide pedestrians and bicyclists the opportunity to cross halfway to San Francisco. The MTC website reports that a 15.5-foot wide bicycle and pedestrian lane will be provided on the east bound deck. This will open a new opportunity for recreational hiking and biking as far Yerba Buena and Treasure Island but there is no mention of continuing the path on the West Span.

An integral part of this proposal is the combined pedestrian/bicycle path on each side of the HST support structure. As noted in the discussion of security issues, this pedestrian pathway will also serve as an emergency exit from the railway in the event a train must be evacuated while on the Bridge. A one-way exit gate will provide security to maintain separation of the two corridors at all other times.

This West Span pedestrian corridor or "tube " will for the first time, allow pedestrian and bicycle commuting from the East Bay, all the way into SF.

It is proposed that this smaller pedestrian tube be approximately 10 feet wide on each side so that both tubes are bi-directional. Joggers, bikers, and hikers must have the opportunity to acknowledge each other from opposing directions and experience the occasional but inevitable chance happy meeting of friends and acquaintances on the Bridge.

Unlike the Golden Gate Bridge, the new Bay Bridge pedestrian route should be completely contained. Current events dictate that this pedestrian route be securable and patrolled, for the foreseeable future. Therefore the open air tube is a fully secure, lattice structure with the a continuous security grille that still allows generous clearance, more that enough to press a face up to or easily compose a photograph of a passing ship.

I131-1 cont.

In the description of individual HST segments, the proposed HST railway bridge to the Oakland Army Base is described in further detail. This railway to and through the Oakland Army Base, to downtown Oakland can also be designed to carry pedestrian is a similar secondary tube. In this way, a recreational and commuting pedestrian and bicycle option is created directly between the downtowns of Oakland and SF.

Security can be maintained by charging a nominal fee to all bicyclist, joggers, and tourists to fund a specially trained security staff who will be immediately available in the event of a train emergency, or other serious condition such as high winds or earthquake. With mobile communications and monitoring equipment a security staff of EMT trained personnel should be able to manage the entire length of the paths.

The inherently limited access will make fee collection manageable and offer the opportunity for allied law enforcement agencies to apply minor routine screening of individuals wishing to cross, if necessary.

As the TransLink fare card access system is introduced the Bay Area, it should be possible for bike and pedestrian commuters to move through entry points quickly.

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Yerba Buena Island will be accessible by pedestrians and bikes from both sides of the Bay. Improvements to ferry service for the planned future development of Treasure Island would be a compliment to the new pedestrian and bike routes.

I131-1 cont.

CONCLUSION

Development of the High-Speed Rail Program and of the Transbay Terminal has encountered delays that may present a unique opportunity: they leave us all enough time to search for possible enhancements to both projects, and for what should be the most exciting High-Speed Train Station in the United States, if not in the world.

This commentary was prepared with the hope that those who will read it will then consider its contents and reflect on the merits of any or all of the ideas, thoughts, suggestions, and concepts.

Not too long ago a noted architect said that "So many things can go wrong with any building project, it is a wonder anything gets built at all". SFGC carries "all the things that can go wrong" to a whole new level, excuse the pun.

There are extreme challenges to everyone involved, from community and local political leaders, public officials and agency directors and staffs including all of the Transbay Redevelopment Project teams, planning, zoning, and building officials, Transbay and Rincon area property owners, businesses and residents, consultants in all of the specialties and disciplines.

I131-1 cont.

In considering a new California High-Speed Rail System, such a visionary proposal may be taken with some skepticism. Some readers might ask themselves how this could be done; others might assume that the problems are insurmountable and that this cannot be done. In all instances, one should remember historical It-can't-be-done's and remember how Americans took the lead in finding solutions.

This document aims at rallying not just support but the suggestions and ideas of those who will not be defeated by the thought of failure.

Eventually, all of us will one day be passengers on the HST. As future HST passengers, let us ask ourselves one more question: "When I catch the 4:05 P.M. departure for Los Angeles, where would I like to board the train, on an bright open platform under the sky, with a view of the City, the Bridge and the Bay, or on a platform 30 feet underground?"

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ACRONYMS

CAHSRA - California High Speed Rail Authority

DSP - (Caltrain) Draft Strategic Plan

EIR/EIS - Environmental Impact Report / Environmental Impact Study Commissioned by the US Department of Transportation Federal Railroad Administration

HSR - High Speed rail system, including trains, rails, etc.

HST - High Speed Train(s), a term often mistakenly used as meaning HSR

TBT - Transbay Terminal

MTC - Metropolitan Transportation Commission

SFGC - San Francisco Grand Central (aka San Francisco HST Station)

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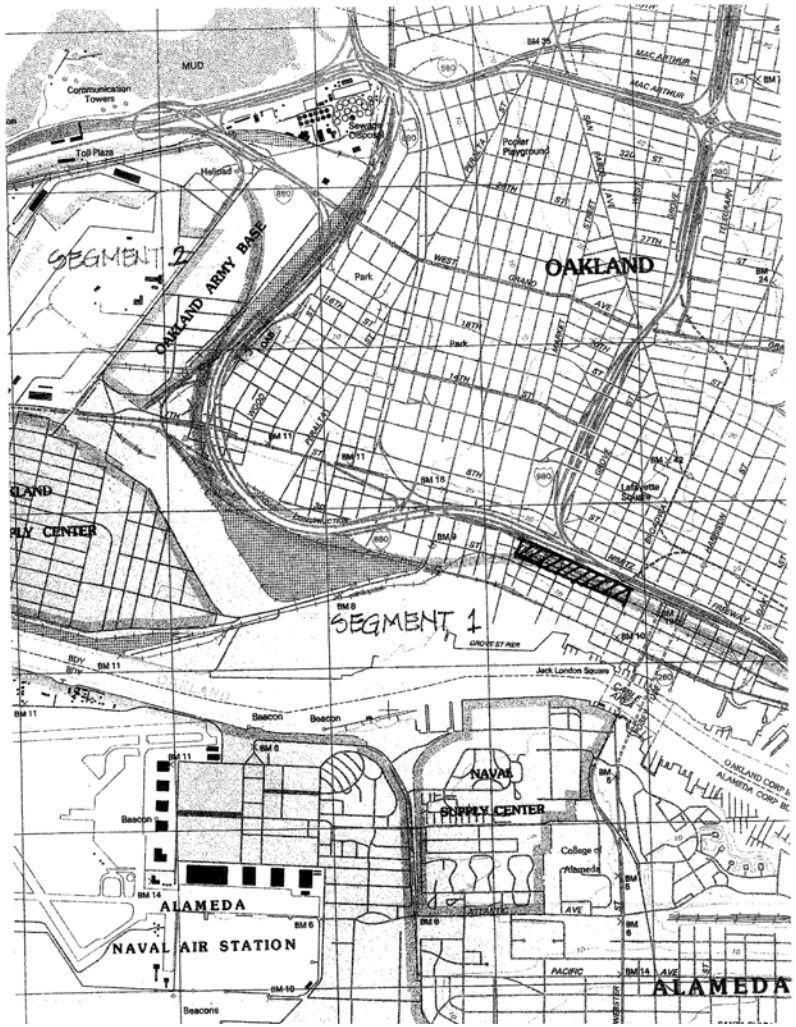
SFGC – A 21st Century Vision

ANNEX 1

TABLE II: PENINSULA COMMUNITIES V/V EAST BAY COMMUNITIES
(train stops – North to South)

A. PENINSULA COMMUNITIES	B. EAST BAY COMMUNITIES
South San Francisco	Oakland
San Bruno	Hayward
Burlingame	San Leandro
San Mateo	Union City
San Carlos	Fremont
Redwood City	(Milpitas)
Atherton	Santa Clara
Menlo Park	San Jose
Palo Alto	
Mountain View	
Sunnyvale	
Santa Clara	
San Jose	

Douglas L. Frazier, AIA - 32 - August 30, 2004



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